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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

TITLE: RETROFIT FRONT SUSPENSION
STABILIZATION SYSTEM FOR
STRAIGHT AXLE VEHICLES WITH
LIFT KITS

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BACKGROUND OF THE INVENTION

1. Field of The Invention

The present invention relates to vehicle suspensions and modifications thereto.

2. Background Information

A very popular form of recreation involves the use of sport vehicles to traverse a variety of off-road environments. An example of such a vehicle is the classic version of the JEEP brand vehicles.

As off-road enthusiasts encounter ever more challenging terrain, a stock vehicle, even one designed for off-road use (like versions of the original JEEP brand vehicles), is not always up to the task. The issue is not always adequate power, or even traction, but primarily one of ground clearance. Whether to avoid becoming "high-grounded", or even more importantly, to avoid damage to the underside components of the vehicle, raising the vehicle relative to the ground is a frequent solution. This involves installing "life kits."

A particular stability problem is associated with straight axle versions of vehicles with lift kits (as opposed to those having independent front suspension). Even

1 when not in motion mere moving of a steering wheel from side
2 to side causes these vehicles to rock from side to side - a
3 problem which is greatly magnified when the vehicle is in
4 motion, and even more so over rough terrain.

5 Lack of vehicle stability is always a safety issue,
6 particularly for vehicles which are, even in stock
7 configuration, known for higher roll-over risks than
8 standard vehicles. Adding the above stability issues
9 through addition of a lift kit to a straight axle JEEP
10 vehicle, for example, creates a near intolerable safety
11 issue, particularly if the vehicle will be driven on public
12 streets and highways, and at normal speeds.

13 Given the fact that owners of suitable off-road
14 vehicles simply will install lift kits, as there are, at
15 present, no legal prohibitions to the contrary, it would
16 well serve the interests of these vehicles, as well as
17 society in general, to provide some means by which some
18 degree of safety can be returned to straight axle off-road
19 vehicles, even after the addition of a lift kit.

20 21 SUMMARY OF THE INVENTION

22 In view of the foregoing, it is an object of the
23 present invention to provide an apparatus for modifying a

1 straight axle off road vehicle for increasing the stability
2 thereof.

3 It is another object of the present invention to
4 provide an apparatus for modifying a straight axle, off road
5 vehicle in which a lift kit has been installed for
6 increasing the stability thereof.

7 It is another object of the present invention to
8 provide a method for increasing the stability of a straight
9 axle, off road vehicle in which a lift kit has been
10 installed.

11 It is another object of the present invention to
12 provide a method for modifying a straight axle, off road
13 vehicle in which a lift kit has been installed for
14 increasing the stability thereof.

15 In satisfaction of these and other related objectives,
16 Applicant's present invention provides an apparatus and
17 associated method for modifying a straight axle, off-road
18 vehicle for increasing the stability of the vehicle. The
19 apparatus (which might also be described as a "kit" or
20 "system" includes a first plate which attaches to the front
21 axle of the vehicle, an adjustable rod with hinge joints on
22 either end, and a second plate which attaches to the
23 vehicle's chassis.

1 The substantially rigid linkage between the axle and
2 the vehicle chassis, which exists upon installation of the
3 present system, provides a very effective counter-measure
4 against the lateral shifting of the vehicle's chassis and
5 the axle - the principle source of the subject vehicles'
6 stability problems.

7 Initial trials reveal that the addition of the present
8 system (nothing similar to which is known to exist for
9 straight axle, off road vehicles such as earlier JEEP brand
10 vehicles) substantially enhances the vehicle's stability,
11 especially (though not solely) when installed in a vehicle
12 already having a lift kit.

13 14 BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a perspective, partially exploded view of a
16 generic example of the components of the present system,
17 shown in relation to the principle vehicle components to
18 which, or in relation to which, the system components are to
19 be installed (respective points of attachment being
20 indicated by dashed lines).

1 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

2 With reference to Figure 1, the system or kit of the
3 present invention is identified generally by the reference
4 number 10.

5 System 10 includes an axle attachment plate 12. Axle
6 attachment plate 12, in the preferred embodiment, is sized,
7 shaped and configured for attachment to the differential A
8 of a four wheel drive, straight axle vehicle. As is clear
9 from the drawing, axle attachment plate is designed to
10 attach to the differential A using the same bolts or studs
11 as secure the differential's access plate. Thus,
12 installation is very straight forward and requires no
13 permanent or time-consuming modification to the vehicle or
14 its components. Mounting tabs 14 extend from axle
15 attachment plate 12 for receiving and interfacing with an
16 eye-member structure (to be described hereafter).

17 An alternative embodiment of an axle attachment plate
18 for use with a non-four wheel drive vehicle (not having a
19 front differential) may include a different version of the
20 axle attachment plate which is not configured as just
21 described.

22 System 10 next includes a stabilization rod member 16.
23 It is this member which provides the rigid linkage between

1 the axle (or differential, which, functionally, is a part
2 thereof) and the vehicle's chassis (a portion of which is
3 identified by the reference character B in the drawing).

4 The stabilization rod member 16 of the preferred
5 embodiment of the present system 10 includes hinge joints 18
6 on each end, each having an eye member 20. This
7 configuration involves each terminus of stabilization rod
8 member 16 having a threaded orifice, into which a threaded
9 stud 22 is received and of which, in turn, eye members 20
10 are respective parts. Nuts 24 secure threaded studs 22 in
11 the desired orientation and extent of reception into
12 stabilization rod member 16.

13 One of the two eye members 20 are to be interfaced with
14 mounting tabs 14 of axle attachment plate 12, the other to
15 be interfaced with mounting tabs 26 of chassis attachment
16 plate 28.

17 Chassis attachment plate 28 is (as depicted in the
18 drawing) to be attached to chassis B of the vehicle. This
19 attachment may involve drilling holes and using conventional
20 nuts and bolts (not shown in the drawing). Also, of
21 course, the attachment may be made by welding.

22 Although the invention has been described with
23 reference to specific embodiments, this description is not

1 meant to be construed in a limited sense. Various
2 modifications of the disclosed embodiments, as well as
3 alternative embodiments of the inventions will become
4 apparent to persons skilled in the art upon reference to the
5 description of the invention. In particular, it should be
6 noted that reference to JEEP brand vehicles is merely the
7 presently envisioned best application of the present
8 invention. Other vehicles, including some by FORD,
9 CHEVROLET, DODGE and TOYOTA and which may be modified with a
10 lift kit will likewise benefit from use of the present
11 system and method.

12 It is, therefore, contemplated that the appended claims
13 will cover such modifications that fall within the scope of
14 the invention.
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